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3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last 5 years [2022, 2021, 2020, 2019, 2018]

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedi	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
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2	V.K.PALLAW		PERFORMANCE ANALYSIS OF DIFFERENT DATA EMBEDDING TECHNIQUES: CRYPTOGRAPHY, STEGANOGRAPHY & WATERMARKING	Inte rnat iona l Con fere nce	IEEE (	International	2022		Greater Noida Institute of Technology, Greater Noida	IEEE
3	Mr. Sushant Kumar		Environmental effects of cement production: A review	Futu re Lear	Future Learni ng	International	2022	nder publicati	Greater Noida Institute of Technology	Springer
4	[redacted] Iqbal Ahmed Khan		Industry 4.0 Implications for Industries-Academia in the Indian Context	2nd Indi an Inte	IEOM India, NIT, Waran	**International**	**2022**		Greater Noida Institute of Technology, Greater Noida	
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Environmental effects of cement production: A review

Abhijit Das[1], Sushant Kumar[2], Prashant Sharma[3*] , Neha Sharma[3],

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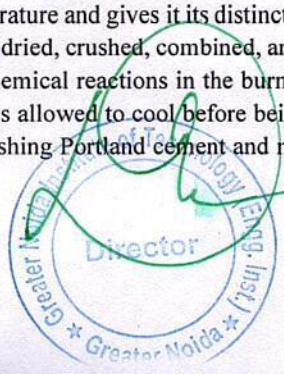
Abstract:
This study examines the consequences of cement production on the environment and possible solutions to global warming. A rise in cement production has led to a decline in nonrenewable resources like limestone. Extracting resources from natural ecosystems increases the risk of ecological imbalance and destroys the green environment, home to many plant and animal species. Rapid usage will likely deplete this limited resource in the near future. In addition, the company's raw material processing phases produce dust, noise, and greenhouse gases, especially carbon dioxide, which degrade the environment and worsen climate change. Unwanted environmental impediments hinder daily life. Better cement plant production processes can help reduce pollution by creating cleaner cement. Industrial waste could be utilised as a cement additive or in cement-free concrete, lowering the country's cement use and improving the environment. If we want to utilise other materials as concrete binder, we must use products that use less natural resources, are more cost-effective, and cause less environmental harm. It will make the environment more resilient and healthier for future generations.
Keywords: Global Warming, Sustainable Manufacturing, Ecosystem, Environment Impact, Cement Production

1. Introduction

Due to its inherent advantages, concrete is the most extensively used building material [1]. The appeal of concrete is primarily due to its superior mechanical properties and low cost [2–5]. It'll most likely used to produces a variety shapes and sizes of structural elements [6]. Furthermore, traditional concrete production is expected to reach around 6 billion tonnes per year globally [7]. Cement as a solitary binder in concrete creates a solid, weight-bearing mass. For over 200 years, regular cement has been used as a primary component of concrete in construction [8]. China is the world's largest producer of concrete and produces some of the world's highest-quality cement [9]. China produced 2.15 billion metric tonnes of cement in 2012, with India accounting for 8.6% of total production and the US accounting for 29% [10]. The total volume of cement produced in 2016 was over 4174 MT. It increased by 24.96 percent compared to overall output in 2010 [11]. The use of cement is increasing, which has predictable implications for energy consumption and pollution. Because Portland cement requires precise mixing of raw materials, open-pit mining is used. China produced 22,489 thousand tonnes of cement in August 2020, while Malaysia produced 1866 thousand tonnes, as shown in fig 1 [12]. The use of aggregate, particularly limestone, which is required in the production of Portland cement, is increasing as the demand for cement grows [13–14]. When the answer is that energy consumption has increased significantly in the twenty-first century [15], nonrenewable resource exhaustion becomes a growing concern. Non-renewable resource reserves will unavoidably be depleted when they are extracted from the environment and exploited for economic purposes due to the dominance of the quarrying and mining industries. Nonrenewable resources are in short supply, and once depleted, their stockpiles do not replenish. Ecosystem destruction, river damage, and dust contamination have all been linked to the continued extraction of natural resources [15–17]. Thus it is important to stop the extraction of natural resources. The use of cement is increasing, which has predictable implications for energy consumption and pollution. Because Portland cement requires precise mixing of raw materials, open-pit mining is used. Bulldozers and dump trucks, as well as excavating, blowing, and other heavy earthmoving equipment, are used in quarrying. A good mix of calcium, silica, aluminium, and iron is required to make the typical clinker composition. Lime and silica are the main components of cement, while iron lowers the reaction temperature and gives it its distinctive grey colour. Clinker is made from limestone, shale, and clay that has been prepared, dried, crushed, combined, and baked at temperatures between 1200 and 1450 degrees Celsius in cement ovens. Chemical reactions in the burning area require a high temperature. Clinker, a nodular substance formed in the oven, is allowed to cool before being used. Clinker is then used as the main component in the production of cement. Crushing Portland cement and mixing it



Industry 4.0 Implications for Industries-Academia in the Indian context

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Abstract. Globally developed countries have taken lead in exploring, implementing and enjoying the benefits of Industry 4.0 through synchronization of various stake holders such as government, industries and academia. Industry 4.0 technologies are applied in creation of smart cities, smart factories, smart machines, smart products, smart services, predictive maintenance, unmanned vehicles, drones, smart warehousing, collaborative robots etc. The use of Industry 4.0 technologies facilitates fast and better living, efficient services, self adjusting machines, high level automation in the industries with or without human intervention especially in hazardous environments. Fourth Industrial revolution has a potential to transform whole manufacturing system into smart manufacturing system in industries through the integration of Industry 4.0 technologies such as Big Data Analytics, Artificial Intelligence (AI), Cyber Security, Cloud Computing, Collaborative Robots, Additive manufacturing, Augmented reality, Cyber Physical system (CPS), smart sensors etc. This paper elaborates on an overview of Industry 4.0 technologies, challenges and their penetration in the industries through collaborative efforts of industry and academia. Further, highlighted the preparation strategies of the academia for smooth adoption of latest technologies by Indian industries through the trained passing out engineers and supporting infrastructure.

1. Introduction

Journey of civilization is a continual process and it never stops, because of dynamic need of time in all walks of life. With the passage of time, society always tries to explore and upgrade themselves in terms of quality of life, comfort, ease and safety. The witnessed milestones in terms of industrial revolutions across the world are shown in figure 1. This figure reveals Industrial revolutions 1.0, 2.0, 3.0 and 4.0 with their timeline. Fourth Industrial revolution begins nearly 2012 in Germany with development and applications of digital technology. Further, I4.0 technologies can be used almost in all the fields such as manufacturing, service sector, healthcare, logistics, agriculture, transportation, education etc. Proper selection of Industry 4.0 technologies provides quality, enhanced productivity, predictive maintenance, safety, and comfort in real time. On one hand, it produces smart products such as smart lights, ACs, doors, smart homes etc. whereas, on the other side, smart processes, smart machines, smart tools which are self-sensing, self-adaptive and self-configure in real time. As a consequence, machine itself adjust its input and output parameters and maintained quality standards. Further, through machine learning (ML), remaining useful life (RUL) can be determined which can be basis for adopting proactive measures to ensure consistent performance with enhanced life. Also services point of view in transportation, people can check the location of their booked vehicle. Drones

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MDPI

Article

Characterization of Al-6061 Castings Fabricated by Microwave Energy Technique

Md. Modassar Anwar [1], Girendra Bhati [1]*, Vaibhav Gangwar [1] and Gagan Varshney[1]

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Abstract: The demand for the handling of aluminum alloy is expanding attributable to their broad use in high unambiguous strength products. Therefore, the need for improvement of a quicker and more financial root to deal with such material has been felt. In this paper, microwave energy has been used to heat the Al 6061 metal to produce the casting products with more dimensional accuracy and surface finish. The applicator used for the melting, having 2.45 GHz microwaves at 600 W to 900 W. Three most significant process parameters with different levels have been selected as power, susceptor material and heating time. The influence of process parameters on tensile strength have been investigated with the help of Taguchi's technique. Optimization of process parameters indicated that the maximum value of tensile strength has been achieved at 750W power, stone charcoal susceptor and 180 minutes heating time. SEM microstructure study, XRD and EBD analysis have been done for more tensile specimens.

Keywords: microwave casting, tensile strength, SEM microstructure, XRD analysis

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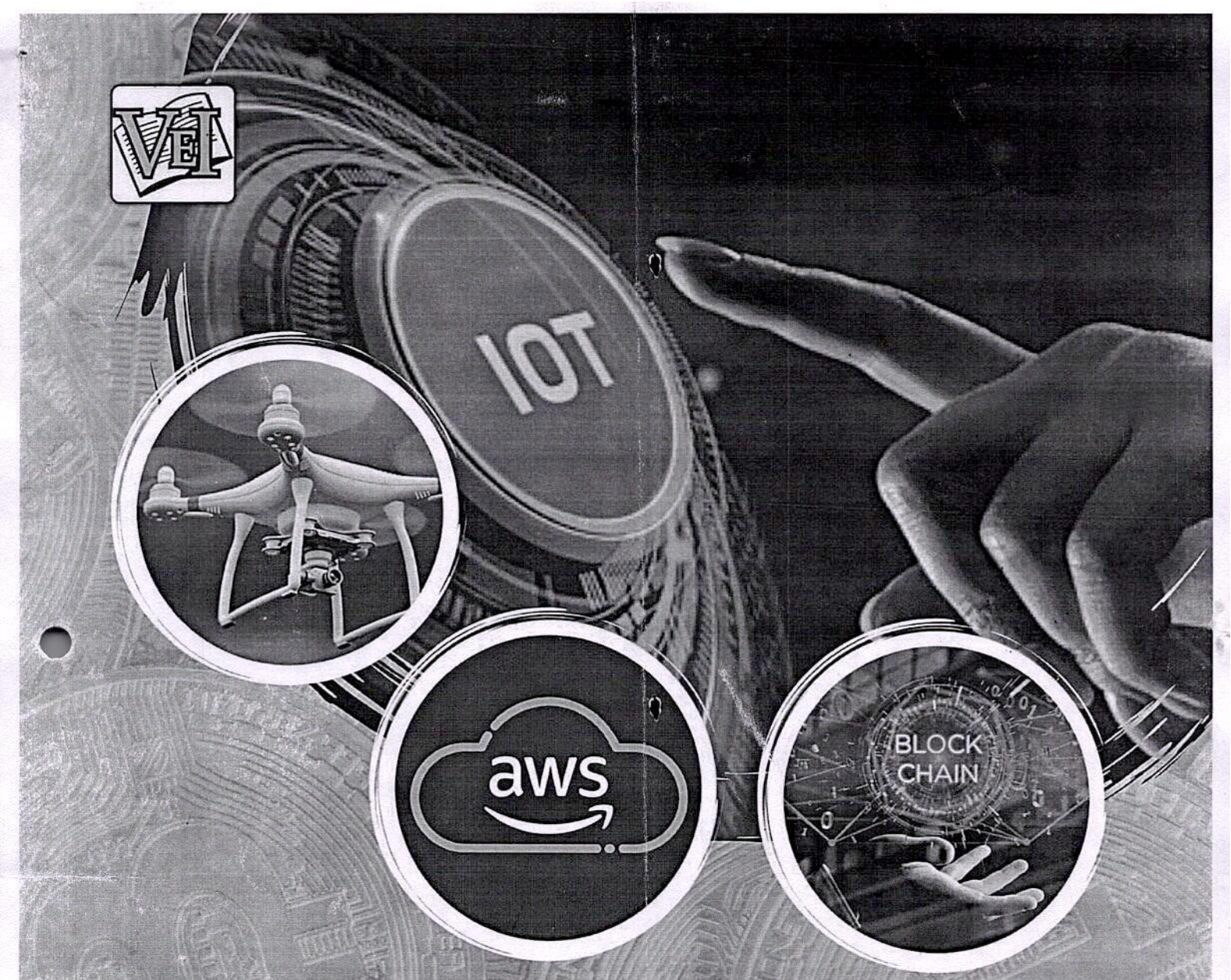
1. Introduction

The projecting of metals is one of the essential assembling processes utilized in ventures and is one of the affordable courses for delivering helpful parts. Average ordinary projecting cycles include charging of heaters, keeping up with of high temperatures (utilizing unmanageable materials) for softening and projecting of liquid metal into wanted shapes utilizing molds. Notwithstanding, customary projecting cycles have a few disadvantages with regards to higher energy utilizations, longer liquefying times and higher imperfection developments. To conquer the downsides of ordinary projecting cycles; new cycles were created [1-3].

Microwave material handling has arisen as one of the promising strategies in the field of assembling. It has been widely executed in the field of joining, sintering, cladding, pottery, powder metallurgy and so forth of mass metallic material. It is been broadly utilized because of decreased assembling cost, handling time, fine microstructure, less deformities and so on as contrasted and customary strategies. Microwave energy has been by and large utilized in clinical, food handling, drying and so on. This work has been centered around the advancement of new arising innovation, for example microwave projecting/liquefying of non-ferrous metallic materials. Microwave projecting is an arising field of exploration with heaps of holes to be satisfied. Notwithstanding, handling any material under microwaves is dependably troublesome [4-10].

Microwave projecting is additionally separated into in-situ and ex-situ projecting. In the in-situ projecting cycle, the device is planned so that the liquefied charge goes through a sprue due to gravity and scopes to drag and adapt segment. In drag and adapt it is permitted to cement and get the ideal shape. In ex-situ arrangement, the charge is permitted to soften through microwave radiations yet the drag adapt area is set external the hole.



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This is to Certify that Dr./Prof./Mr./Ms. GIRENDRA BHATI of J C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA, FARIDABAD, HARYANA has participated and Presented the paper titled A REVIEW ON THE INFLUENCES OF PROCESS PARAMETERS ON MECHANICAL PROPERTIES AND MICROSTRUCTURE OF FREEZE CASTING PROCESS in the "Third International Conference on Robotics, Intelligent Automation and Control Technologies (RIACT 2022)" organized by School of Mechanical Engineering, Vellore Institute of Technology, Chennai, India in association with School of Computing, Engineering and Digital Technologies, Teesside University, UK and Department of Mechatronics and Mechanical Engineering, Bochum University of Applied Sciences, Germany between 23rd and 25th of September 2022.

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Review Paper

A Review on the Influences of Process Parameters on Mechanical Properties and Microstructure of Freeze Casting Process

Girendra Bhati[1*], Vikram Singh[2], Sanjeev Kumar[2] and Sudhir Kumar[3]

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Abstract: In the present scenario, it is a big challenge to produce well controlled porous structured materials with complex shape and geometry based ceramic castings. This paradise can be achieved by freeze casting process. Freeze casting process is preferred over other processes because of low production cost, porous structure, crack-free ceramics, ecofriendly, a wide range of composites, complex shape and zero shrinkage products. The purpose of this review paper is to enlighten the effects of process parameters on mechanical properties and microstructures. At low freezing temperature and high sintering temperature, the microstructure of casting is dense and compact i.e. having less porosity and pore size as well as higher compressive strength and hardness. Larger solids loading in slurry possess less amount of solvent and thus produce low porosity and high density results higher compressive strength. So, the mechanical properties have improved at low freezing temperature, high sintering temperature and solid loading.

Keywords: Particle Size, Freezing Directions, Sintering Temperature, Compressive Strength, Porosity, pore size.

1. Introduction

In last two decades, researchers are focusing on the casting of well controlled porous structured materials with complex shape and geometry based ceramic products. They used various processes such as direct forming, powder metallurgy, sacrificial template process, sol-gel casting and slip casting. These processes have many disadvantages. Direct forming method and powder metallurgy methods are not flexible in control of porosity and pore size. Sol-gel casting and sacrificial template process have large shrinkage of gels upto 25% of the volume. These are not suitable for complex shaped ceramics. Slip casting process has low dimensional precision. The castings produced by slip casting process, are much affected by differential shrinkage rate. Also, all these processes demonstrated the limited range of industrial products. None of these techniques use the freezing of ceramic slurry before heating or sintering due to which the porosity and pore size in castings are not in control [1-6].

Freeze casting process is preferred over these processes because of low production cost, porous structure, crack-free ceramics as well as ceramic-metal composite, complex shape and zero shrinkage products. Freeze casting process has these advantages over other manufacturing processes-

- No material burns during sintering process.
- It is cost effective.
- Simple equipment used in experimental set-up.
- It is environment friendly casting process.
- More flexibility in the control of porosity as well as pore size by the concentration of suspension solution.

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OPTIMIZATION OF PROCESS PARAMETERS OF Al-6061 CASTINGS PRODUCED BY MICROWAVE ENERGY TECHNIQUE

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[1] Research Scholar, Greater Noida Institute of Technology, Greater Noida, Gautam Buddha Nagar, U.P.201310, India
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ABSTRACT

In this paper, microwave energy has been used to heat the Al 6061 metal to produce the casting products with more dimensional accuracy and surface finish. The applicator used for the melting, having 2.45 GHz microwaves at 600 W to 900 W. Three most significant process parameters with different levels have been selected as power, susceptor material and heating time. The influence of process parameters on hardness have been investigated with the help of Taguchi' technique. Optimization of process parameters indicated that the maximum value of hardness has been achieved at 750W power, stone charcoal susceptor and 180 minutes heating time. The optical microstructures have been studied for the most harder casting specimens.

Keywords: Microwave Casting Technique; Al-6061 alloy, Hardness strength, Microstructure Study

1. INTRODUCTION

The research we are working on is Al-6061/SiC charcoal using the microwave casting technique. We know about some materials and reinforcement like aluminum; silicon carbide and charcoal matrix composites. Which is used in automotive industries due to its tensile strength, more strength to weight ratio, more wear resistance, elevated temperature hardness, and more stiffness [1]. The development of new technologies is required for the joining of aluminum, which causes a minimum effect on the mechanical. Microwave energy can be effectively used for metal processing. In microwave processing, the fundamental of heating is the opposite of the traditional heating process. In the conventional heating process, the heat is conducted from the surface them to the inner core of the metal, therefore heating is uniform throughout the material [2]. The Microwave casting has various advantages over conventional processing techniques such as selective heating, volumetric heating, and less processing time resulting in significant energy saving and fabricated the castings of fine microstructure as well as better properties. Generally, microwaves which are electromagnetic waves of wavelength variation between 1 mm to 1 m and the frequency lies between 300 MHz and 300 GHz [3-4].

2. LITERATURE REVIEW

This section means to display and feature past research, comparable or connected with this work completed by different researchers, and furthermore to foster an essential comprehension of cross breed composite utilizing the mix casting method for Aluminum Alloy. Mishra and Sharma revealed the investigation of cast microstructure acquired involving in-situ microwave casting of Al 6061. The interaction was done under the modern microwave of 900 W powers at a recurrence of 2.45 GHz. The ongoing bend among time and temperature was gotten utilizing an implicit IR pyrometer. The time temperature bend characterizes there were four unique stages that had an alternate method of warming. The method of warming was helped by the presence of an oxide layer which goes about as a susceptor. Porosity investigation shows an extremely low porosity of under 2%. Further, they had concentrated on the adjustment of openness time, softening time, and cast capacity of Al-Zn-Mg combination with the difference in susceptor and form material. SiC and the artistic cauldron was utilized as susceptor with the end goal of MHH. The charge was set under the shape material of alumina and graphite. From the outcomes, it is seen that the better grains were gotten for the mix of alumina (shape material) and SiC (susceptor) [5]. Reddy et. al. explored the physical, mechanical, warm and underlying way of behaving of the expelled AA 203. Creator clarified that ceramic matrix composites due for its upgraded durability

Multi-Objective Optimization of Process Parameters of HAp-Al_2O_3 Bio-inspired Freeze Castings by Genetic Algorithm

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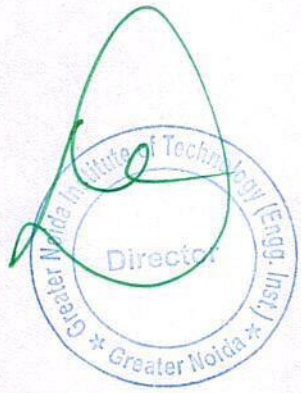
Abstract: In this paper, the different compositions of hydroxyapatite or HAp ($Ca_{10}(PO_4)_6(OH)_2$) and alumina (Al_2O_3) are used as ceramic materials to fabricate the biomaterials by freeze casting process. The mechanical properties i.e. hardness and porosity have been measured at three different process parameters i.e. freezing temperature, sublimation pressure, sintering heating rate. Regression analysis and Genetic Algorithm have been used to find the multi-objective optimized results.

Keywords: Freeze Casting Process, Freezing Temperature, Sublimation Pressure, Sintering Heating Rate, Hardness, Porosity, Genetic Algorithm.

1. Introduction:

In the present scenario, the researchers are focusing on bioinspired materials and its advanced manufacturing techniques. Many techniques are used such as direct forming method, powder metallurgy, sol gel and slip casting process. Due to uncontrollable porosity, low compressive and wear strength, low degree of compactness and versatility, these methods have limited uses in ceramics industries. These limitations may be eliminated in Freeze Casting process. In this freeze casting method, pore size and its shape are controllable through process parameters. Freeze casting process consist four basic steps: (i) preparation of slurry or liquid suspension, (ii) freezing of the slurry/suspension, (iii) sublimation of the frozen phase and (iv) sintering. Firstly, the slurry has been prepared and mixed by mechanical stir and then it has poured into a mould. Then slurry filled mould has left for freezing with the help of liquid nitrogen. The freezing process taken placed in a range of freezing temperature which lies between -50 °C to -196 °C. Then followed by the process of sublimation of the solidified state from the solid to the gas state at a very low pressure, and then sintering to consolidate as well as densify the pores/dendrites [1-5].

Tallen et al (2009) prepared the slurry of alumina ceramic powder of particle size 700 nm with additive glycerol in water solvent which was freezed at -190 °C temperature. The slurry in mould was freezed by liquid nitrogen when it was partially immersed in liquid nitrogen tank. The additive glycerol increased the viscosity of slurry as well as



A review of evaporation droplets on a transparent heater

Rupak Kumar Deb [1], Iqbal Ahmed Khan[2]

[1] Mechanical Engineering Department, Lingaya's Vidyapeeth, Faridabad, Haryana,

[2] Mechanical Engineering Department, Greater Noida Institute of Technology, Greater Noida, Uttar Pradesh

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ABSTRACT

Many devices are using transparent heaters and they often face problems due to fogging or icing on the surface of the transparent heater (TH). The fogging or icing is mainly due to the droplet that gets deposited over the surface of the transparent heater. If the evaporation of these droplets from the surface of TH gets obstructed then only the fogging or icing starts. To develop an effective defogging we require the effective evaporation rate of the droplet. Many studies have already been done on the dependence of evaporation on the various factors of the substrate as well as the ambient conditions. In this paper, the evaporation droplet characteristics of the transparent heater are analyzed. Theoretical and experimental investigations on droplet evaporation are reviewed. The dependence of droplet evaporation time and temperature distribution on transparent heater coating properties are studied. Finally, the role of material coating on defogging and defrosting properties of transparent heaters are investigated and discussed. Also, the dependence of surface wettability of transparent heaters on the droplet evaporation property has been investigated.

KEYWORDS

"Droplet", "Defogging", "Defrosting", "Evaporation", "Hydrophobic"; "Thermal conductivity", "Marangoni effect", "Transparent heaters", "Sessile".

1. Introduction

The phenomenon of how liquid droplet is responsible for wetting the solid surface has already been studied since the 18th century. The angle of contact between the solid and liquid is an important factor for wetting the solid by liquid droplet. The role of Contact angle, wetting properties and the bonding of liquid and solid was investigated by Young and Pierre-Simon Laplace. In biomedical and normal life situations, it is very

Corresponding author: Rupak Kumar Deb. Email: deb.rupak@gmail.com

High Performance Dynamic D Flip Flop based on GNRFET in Double Gate Mode

Publisher: IEEE

Farha Naj ; Vivek Gupta ; Mukesh Kumar Ojha ; Priyesh Tiwari All Authors

Abstract:D flip flops may be divided into two categories: static and dynamic flip flops. The dynamic D flip flop is the focus of this research project. The sophisticated design of... **View more**

▸ **Metadata**

Abstract:

D flip flops may be divided into two categories: static and dynamic flip flops. The dynamic D flip flop is the focus of this research project. The sophisticated design of TSPC is complemented by the configuration of the clock and reset (True single phase clocked). When it comes to performing its function and switching operations, the clock and rest signal use a significant amount of power. The necessity for improvements in the power consumption of the TSPC-based D flip flop creates an appealing study arena in which to pursue further advances in the field. Power consumption rises below 16nm as a result of factors such as DIBL or GIBL, which must be addressed in addition to the process itself. It is suggested in this research to use a novel TSPC-based D Flip Flop with Gates Tied Mode (Multi-Threshold CMOS Logic) sleep signal injection for low-power applications in order to minimise power consumption. This study makes use of low power dependant MOS, such as the GNRFET, in order to alleviate the short channel effects in MOS. The usage of GNRFETs in 16nm technology is the emphasis of this work, which aims to reduce power consumption.

Published in: 2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE)

Date of Conference: 28-29 April 2022 **INSPEC Accession Number:**

Low Power Energy Efficient Full Adder using GNRFET

Publisher: IEEE

Sanjay Singh ; Amit Kumar ; Mukesh Kumar Ojha ; Dhiraj Gupta All Authors

Abstract: As the low power requirement is the essential for today's state of art technology, it is necessary to use low power FET device in the designing of full adder which can be... **View more**

▸ **Metadata**

Abstract:
As the low power requirement is the essential for today's state of art technology, it is necessary to use low power FET device in the designing of full adder which can be used in arithmetic logic unit and further can be used in IoT applications. In this work graphene nano-ribbon FET is used at 32 nm technology node to reduce the power consumption moreover the reduce size and better device parameters help GNRFET to provide excellent device performance. The spice simulation for this work has been performed in synopsys HSPICE tool at 32 nm technology. The result of the proposed full adder validated and compared with the already existing full adder design. The proposed full adder circuit shows 99.92%, 85.46%, 97.28%, 87.14% reduction in power consumption, delay, power delay product and leakage power respectively.

Published in: 2022 6th International Conference on Devices, Circuits and Systems (ICDCS)

Date of Conference: 21-22 April 2022

Date Added to IEEE *Xplore*: 30 May 2022

INSPEC Accession Number: 21765875

DOI: 10.1109/ICDCS54290.2022.9780750

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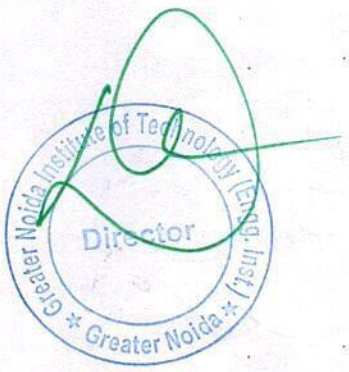

Comparative analysis of Full Adders using CNTFET in 32nm Technology

Publisher: IEEE Cite This PDF

Bhuvaneshwari Shankar ; Priyesh Tiwari ; Dhiraj Gupta ; Mukesh Kumar Ojha ; Shiv N... All Authors

Abstract: In any electronic component, the main factor for measuring the performance criteria is full adders. This thesis investigates and analyses the efficiency of full adder cir... **View more**

▸ **Metadata**

Abstract:

In any electronic component, the main factor for measuring the performance criteria is full adders. This thesis investigates and analyses the efficiency of full adder circuits using CNTFET devices in 32nm technology. The whole adder circuit is built using XOR/XNOR logic types, which are then compared to transistor technology. This thesis has five full adders that follow the technique of actuate potential and one full adder follows the non-actuate potential. Simulations have been carried out using HSPICE to better understand the power consumption, average power consumption, energy dissipation, and latency of an XOR /XNOR full adder. The performance among full adders is compared, and the best low-power full adder of CNTFET is analyzed and further used in new technology.

Published in: 2022 3rd International Conference on Intelligent Engineering and Management (ICIEM)

Date of Conference: 27-29 April 2022

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DOI: 10.1109/ICIEM54221.2022.9853015

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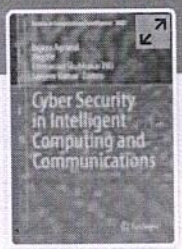


Cyber Security in Intelligent Computing and Communications pp 311–324

Natural Language Processing for Small Businesses and Future Trends in Healthcare

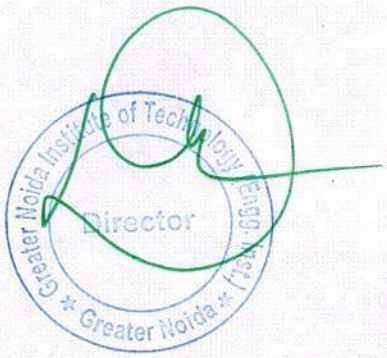
Saurav Jha, Priyesh Tiwari, Shiv Narain Gupta & Vivek Gupta

Chapter | First Online: 12 March 2022

Part of the Studies in Computational Intelligence book series (SCI,volume 1007)

Abstract

The Natural Language Processing (NLP) a computational used for reducing the distance between human and the machine. It means NLP facilitate human to communicate with the machine easily. NLP is a subfield of linguistics and artificial intelligence. NLP can be defined as the automatic manipulation of natural language like speech and text by using python models. The conversation between humans and machines has never been much easier and it is bound to be better in the upcoming decade. The paper distinguishes four phases by discussing a brief introduction to NLP



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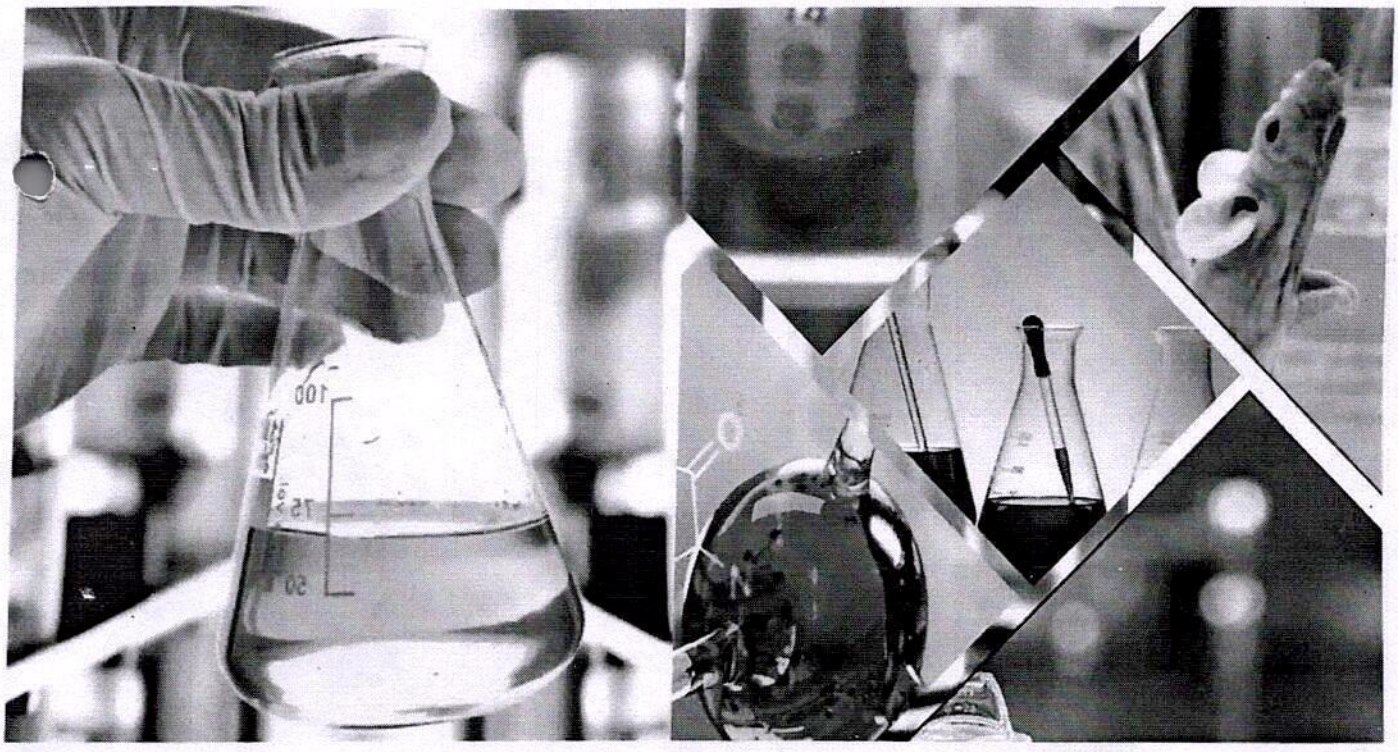

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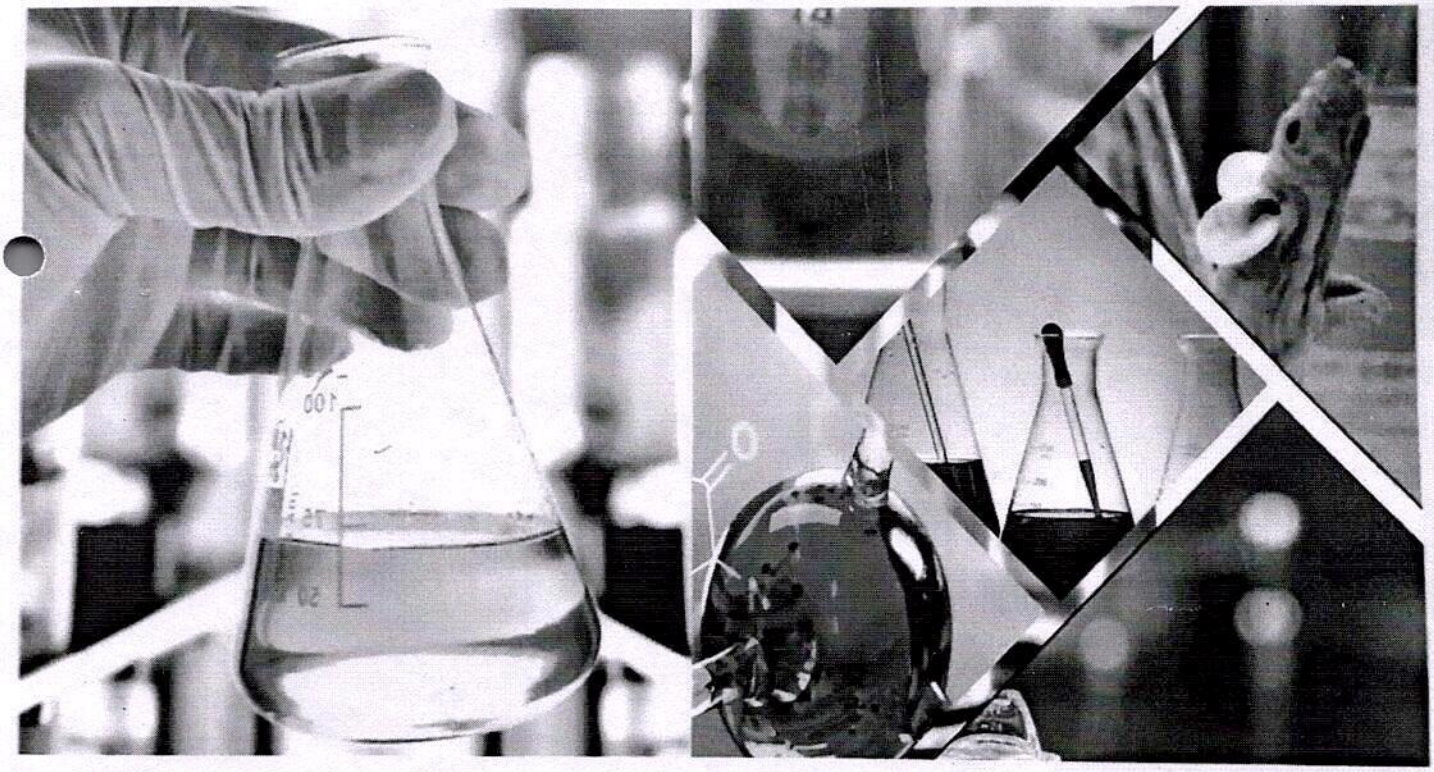

M.Sc. Final Year
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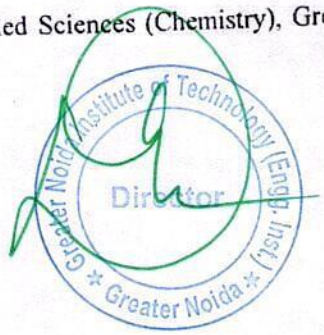

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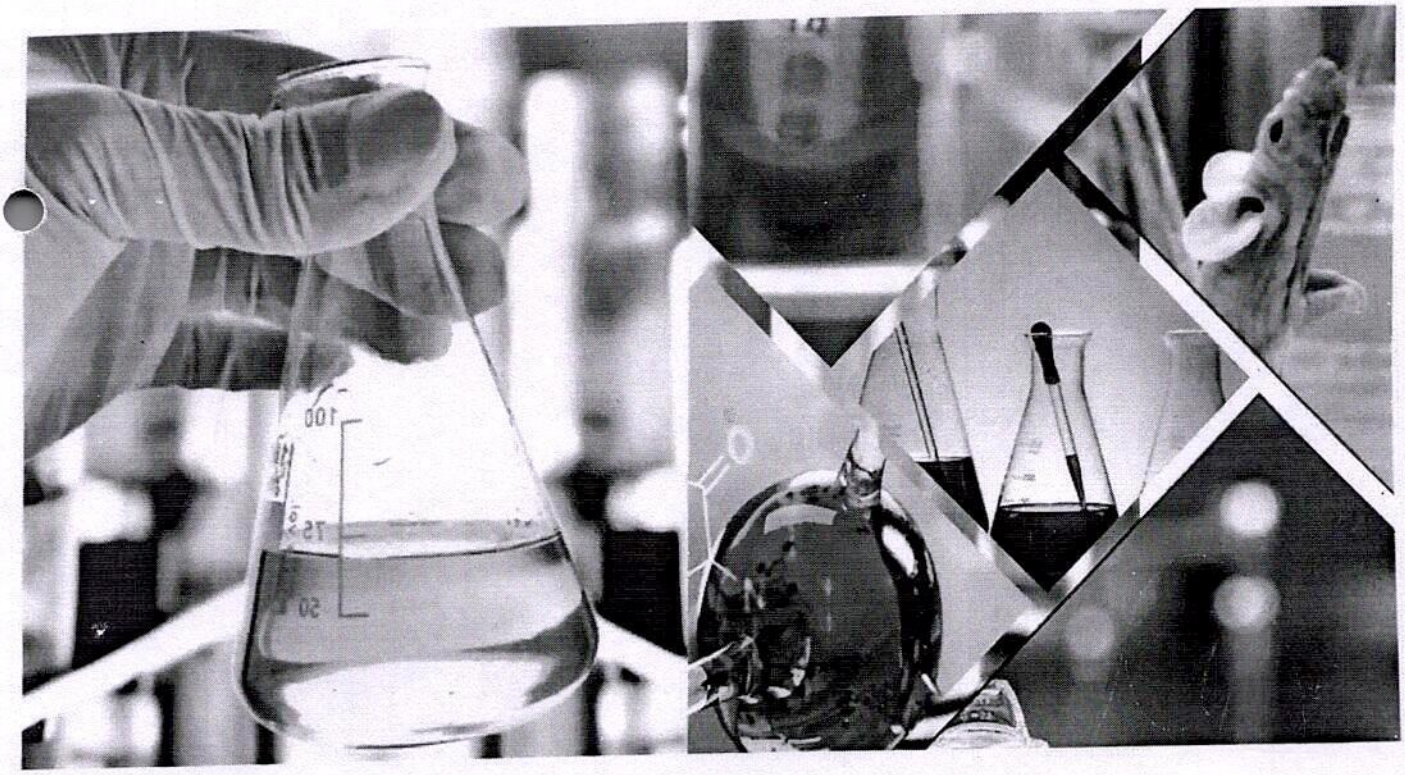

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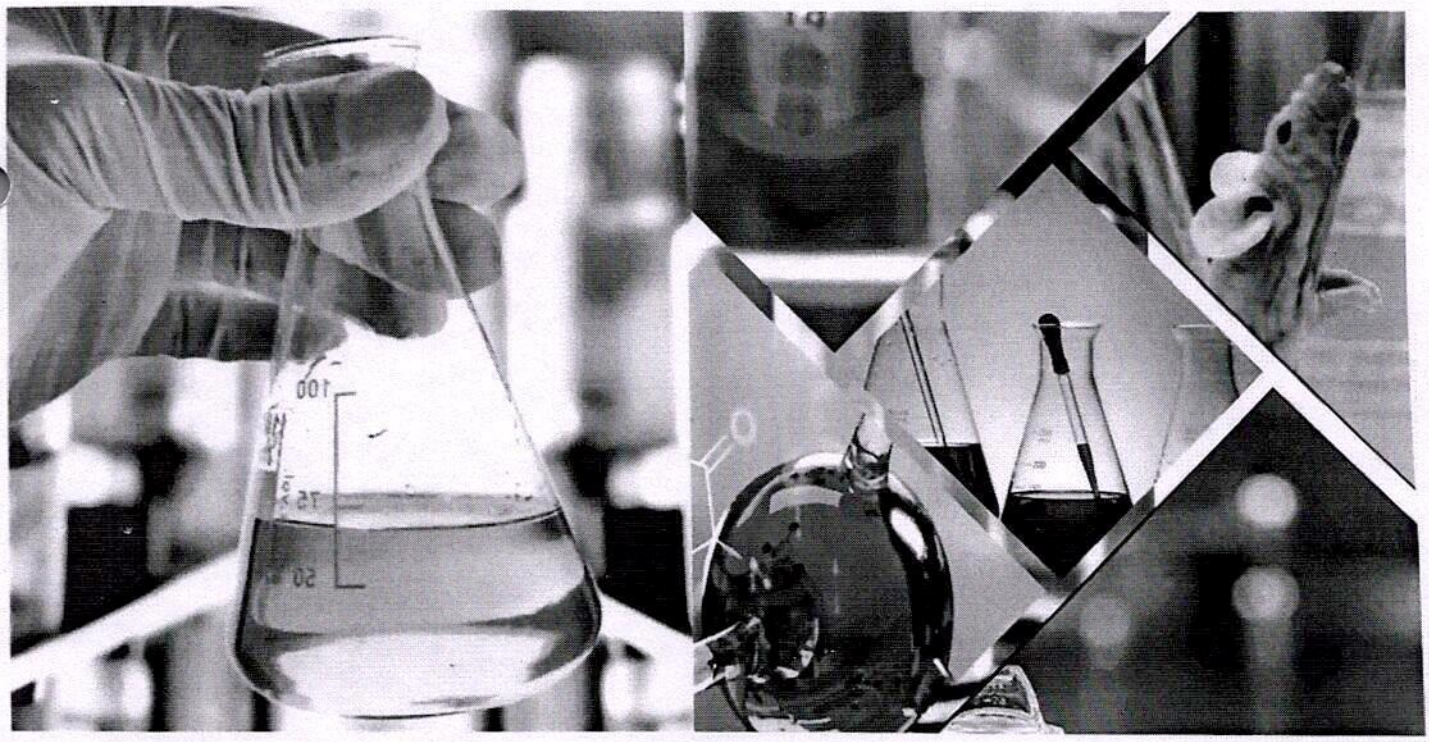

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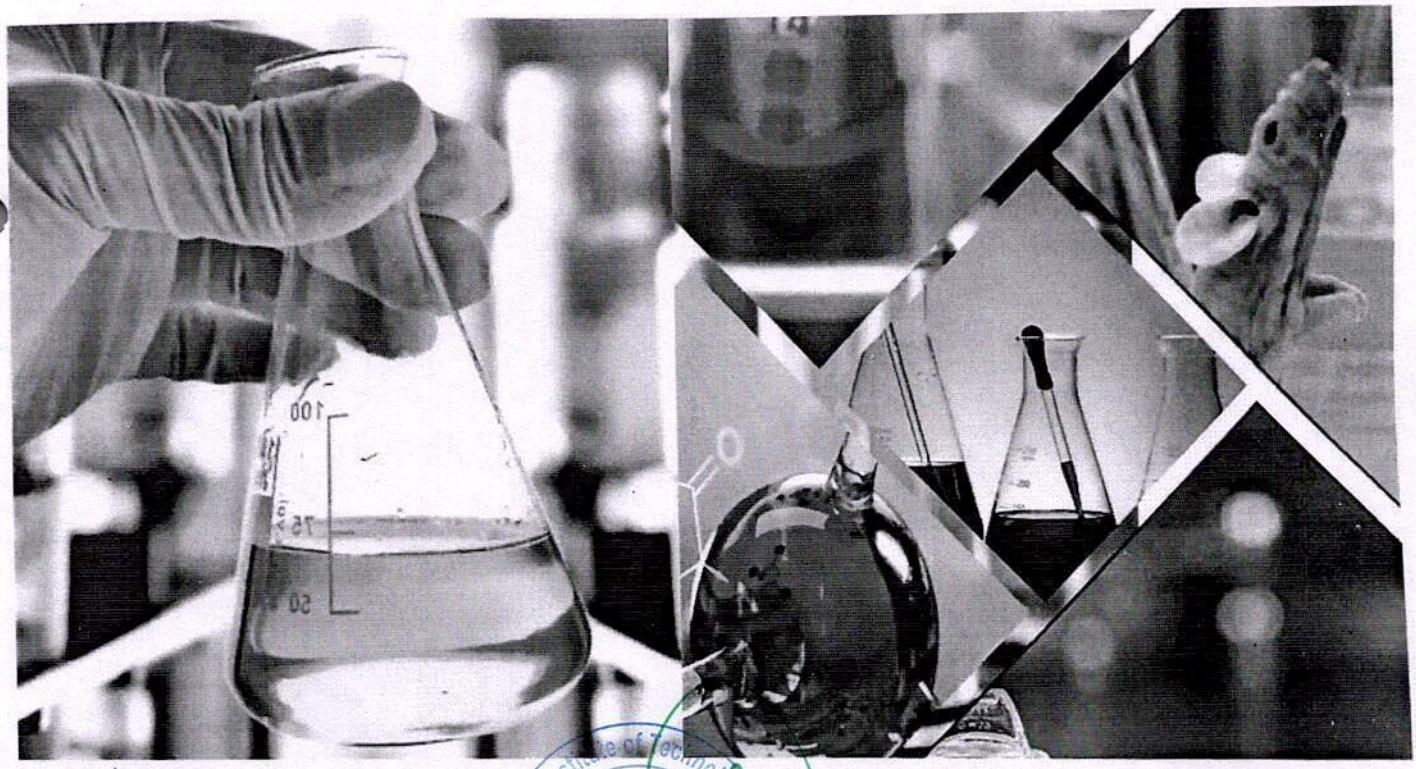

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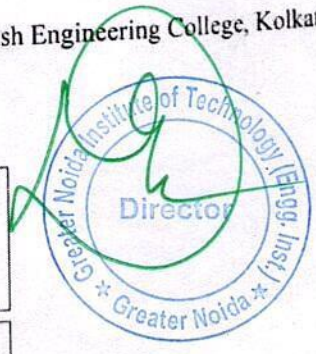

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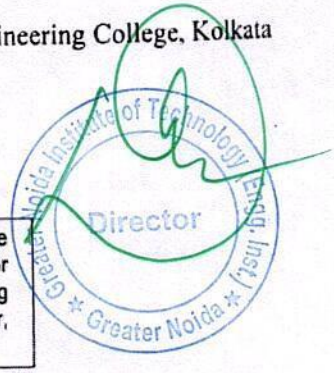

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Study of nuclear shapes of some even nuclei

*M. Singh[1], Y. Singh[2], Gulashan Mahajan[3], A. K. Varshney[4] and K. K. Gupta[5]

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In Davydov asymmetric rotor (β – fixed, γ – fixed) the effect of (ΔK = 2) to state mixing is a classical illustration where γ and ground state levels of energy are plotted against the asymmetric defamation γ of the nucleus [1]. For γ close to 0^0, the Davydove model gives the symmetric rotor 'γ – band' energies. As γ increases the levels of γ – band decreases rapidly in energy and hence the even spin levels of the γ – band interact more and more with their partners in the ground band. The effect becomes extreme above $\gamma = 20^0$. The interaction faces a repulsion which is the origin of the upturn in $E(4^+)$ near $\gamma = 25^0$. Thus, the γ – band levels from the couplets arranged as $(2_2^+, 3_1^+), (4_2^+, 5_1^+), 5_1^+ \ldots$

In another approach, say γ – unstable or Wilets – Jean model [2] the energies of γ – band are expected to form couplets arranged as $2_2^+, (3_1^+, 4_2^+), (5_1^+, 6_2^+) \ldots$ These two different couplets of γ – band energy levels are significant in distinguishing between γ – soft and γ – rigid shapes of a nucleus. Zamfir and Casten [3] introduced a term 'staggering indices' S(I) which has the form –

$$S(I) = \frac{S(I)+S(I-2)-2S(I-1)}{E2_1^+} \qquad (1)$$

A clear distinction is arising in the γ – band in S (I) values, where both models exhibit in energy staggering, the sequencing is exactly opposite that is the phases of the S (I) in both the models would be reversed. Casten examined the values of the staggering indices obtained from the experimental data of even nuclei and found them to be matching with γ – soft predictions showing no evidence of γ – rigidity. Liao considered 140 even nuclei of mass region A = 64 – 200 where the most of the nuclei were found to be γ – soft but a few may be slightly triaxial. Almost all the axial nuclei are sightly γ – soft, some of them exhibiting shape transitions from axial to γ – soft to triaxial shape with increasing angular momentum [4]. In our view point since the nuclei possessing $15^0 < \gamma < 25^0$ are most appropriate to be considered in asymmetric rotor model description as they belong to transitional region. It will not be possible for a triaxial nucleus belonging to $\gamma \leq 20^0$ to show a zigzag pattern of S (I) versus spin (I) in theoretical values. We plotted a number of graphs in S (I) versus spin (I) for $\gamma = 10^0, 15^0, 20^0$ and 25^0 in asymmetric rotor model values [5]. Another thing associated with S (I) is nature of axial rotor. For an axial rotor model the energy spectra has the form –

$$E_I = AI(I+1) - BI^2(I+1)^2 \qquad (2)$$

Here S (I) are small and positive in magnitude that show no zigzag behavior, but increase slowly with increasing spin (I). Of course, S (I) = 0 for all spin (I) if B = 0. $E \propto I(I+1)$ are equally followed by axial as well as triaxial rotor. Thus, it becomes essential to distinguish triaxial rotors from axial rotors. This is done by corroborating them with the values of staggering indices S(I) in γ – band. We observe that the sign of S (I) changes alternatively for odd and even spins in the case of triaxial rotor but, S (I) in axial rotor does not change sign with spin. McCutchen referred to special solutions of the Bohr – Mottelson Hamiltonian that gave predictions for a triaxial structure in respect of five nuclei that is ^{112}Ru, ^{170}Er, ^{192}Os, ^{192}Pt and ^{232}Th [6].

In the present work the authors try to verify whether the nuclei proposed above except ^{170}Er, since it is discussed already in ref [7], are associated with triaxiality and if yes than to what extent. Attempts have been made to discuss ^{112}Ru in recent past but, in ref. 8 only γ – band is considered and not the γγ – band while we consider it to take essential γ – band as well as γγ – band together since both are generated simultaneously by rigid rotor of Davydov.

The asymmetry parameter γ is evaluated from the energy ratio of two band head energies $(R = E2_2^+/E2_1^+)$ using the relation –

$$\frac{E2_2^+}{E2_1^+} = \frac{1+\left[1-\frac{8}{9}(\sin^2 3\gamma)\right]^{1/2}}{1-\left[1-\frac{8}{9}(\sin^2 3\gamma)\right]^{1/2}} \qquad (3)$$

This asymmetric parameter γ is fed to compute the rigid rotor model energies in γ and γγ – bands. The staggering indices S (I) for known experimental γ – band energies alongwith the rigid rotor energies are listed in table 1. The staggering indices for γγ – band in experiment and rigid rotor are listed in table 2.

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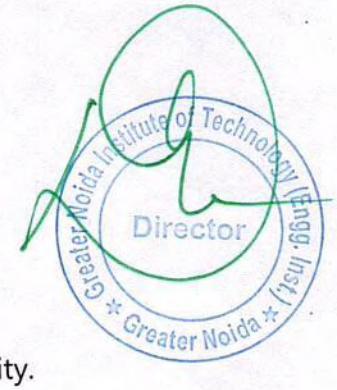

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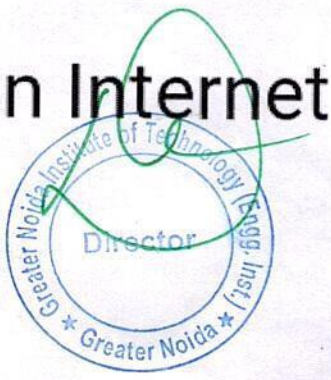

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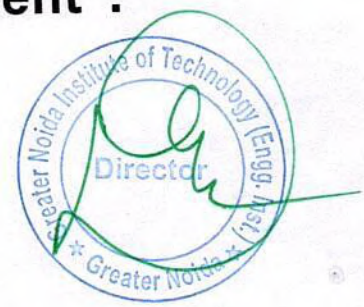

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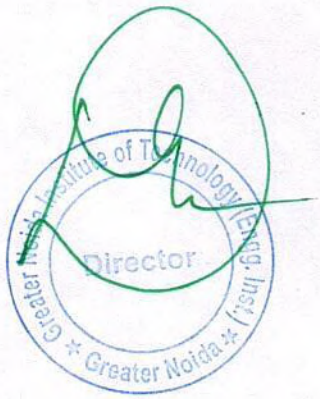

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Fractional Order PID for Load Frequency Control of Time Delayed Islanded Microgrid

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***Abstract*—Microgrids have been rapidly deployed in electric power systems in recent years with significant accompanying benefits. The load frequency control or secondary frequency control problem of microgrid in islanded mode has been addressed in this paper. The microgrid system is comprised of renewable energy sources like wind turbine generator (WTG), solar photovoltaic (SPV), and autonomous electric energy generation sources like diesel generator (DG), and fuel cells (FC) along with two energy storage devices namely battery energy storage system (BESS) and flywheel energy storage system (FESS). The proposed fractional order proportional-integral-derivative (FOPID) controller is designed by using stability boundary locus (SBL) technique to stabilize the frequency changes due to fluctuations in loads, wind speeds and solar intensity in the presence of communication time delay. The FOPID controller delivers the control signal to the generating sources by employing the communication channels. These communication channels are prone to time delay. The time delay can affect the microgrid system stability and in worst case the microgrid system may become unstable. The efficacy of the proposed controller is verified by the simulation results.**

***Index Terms*—Fractional order PID controller, Load frequency control, Microgrid, Stability boundary locus, Time delay.**

I. Introduction

A microgrid can be defined as a power distribution entity having distributive sources like DG and FC, renewable energy sources like solar and wind, energy storage devices like BESS and FESS, and multiple loads. It is very challenging to maintain the microgrid frequency in the presence of so many energy sources and loads. It becomes further difficult to regulate the microgrid frequency in the presence of communication time delay. Recently, the issue of microgrid frequency control with communication time delay has been very much explored in the literature. In [1], the effect of communication time delay on the secondary frequency control of an islanded microgrid with multiple distributed generators has been investigated. In [2], a model predictive control (MPC) and a Smith predictor based control approaches are discussed to deal with the issue of secondary frequency restoration. In [3], secondary frequency control is achieved by a frequency restoration function based consensus algorithm comprising of a load frequency control and a single time delay communication network. In [4], sliding mode estimation based controller is designed to predict the microgrid states, time delay, and to reject the disturbance of estimation errors. In [5], a distributed multi agent finite time control approach having time delays for the state of charge balancing and voltage regulation in a dc microgrid with distributed battery energy storage systems (BESS) has been implemented. In [6], feedback linearization, nonlinear sliding mode control and Artstein transformation concepts are utilized. In [7], a robust proportional-integral (PI) frequency controller based on Kharitonov's theorem has been designed having communication time delay and parametric uncertainties. In [8], secondary load frequency controller based on linear matrix inequalities (LMIs) and Lyapunov stability theory has been formulated for the shipboard microgrid system. The dynamic modeling and operation of a microgrid based on solar and wind energy is presented in [9]. The dc-dc converters are utilized to connect the wind and solar RES to the main dc bus.

In this paper, the stability boundary locus (SBL) approach of PID controller design is utilized [10]. The SBL is an analytical cum graphical technique of obtaining the PID controller parameters from the two dimensional stable parameter space. The SBL methodology is utilized in [11] to design the robust PID controllers with specific gain and phase margin for LFC problem of multi-area power system. In [12], PID controllers are designed for interval LFC system in the presence of communication time delay, GDB, and GRC. In [13], parametric uncertainty margin is computed for the LFC system using SBL technique. The main contributions of this paper are summarized as follows:

1) The new formulae for FOPID controller parameter gains are proposed using SBL approach for dispatchable energy sources in the microgrid, i.e., for DG and FC in the presence of communication time delay.
2) The frequency deviation for the microgrid is determined with wind power, solar photovoltaic power, and load as step inputs in the presence of communication time delay.
3) The comparison of frequency deviation achieved by the proposed approach is accomplished with that obtained by the other approaches available in the literature.

The organization of the remaining paper is as follows. Microgrid system modeling is explained in Section II. The proposed FOPID controllers are designed for both DG and FC in Section III. In Section IV, simulations are carried out followed by the conclusions of the work which is presented

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Low power based ternary half adder using fin type field effect transistor technology

Sandeep Kumar, Anil Kumar Dubey, Vivek Gupta, Mukesh Kumar Ojha

https://doi.org/10.1016/j.matpr.2022.12.036

Abstract

In this paper, we examine a ternary half adder that is low in power and leakage and is based on (FinFET) Fin type field effect transistor technology. The CNTFET Technology, as well as various circuits and implantation procedures for the CNTFET Technology, will be discussed in this chapter. It is shown in this paper that ternary adders using FinFET (Fin type field effect transistor) and ternary adders without FinFET (Fin type field effect transistor) are comparable in terms of latency, peak power distribution, and leakage power of the ternary adder. In this paper, we study several encoders and decoders that make use of FinFET (Fin type field effect transistor) to achieve their desired results. After that, we must get the right result, which is performed by computing the sum and carry of the decoder and encoder circuits. As a result of the evolution of this kind of technology, all electronic devices have become smarter and more trustworthy in terms of their functionality. Improvements in Average Power, Energy, and Power Dissipation may be shown in this experiment.

Introduction

Moore's law has shown that the component of each device in a coordinated circuit has been reduced by a factor of around two at regular intervals. As a key driving factor for technical progress since the late twentieth century, equipment reduction has been the primary driving force behind technological advancement. [1] According to the report of an international technology roadmap for semiconductor (ITRS) 2009 release, further decrement has hit genuine limitations related to manufacturing innovation and device exhibits, as shown by the ITRS 2009 release, since the basic measurement has been lowered down to the sub-22 nm zone. Points of confinement include short channel effects, short channel burrowing, and differences in device construction and doping, to name just a few examples. In addition to electron burrowing via narrow channels and thin protective coatings, and the leakage currents that occur from this, there are other places of confinement. [2] A single carbon nanotube (CNTs) or different types of carbon nanotubes in the typical mass MOSFET structure may be used to reduce these breaking points to some

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Automatic shopping trolley using IOT

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Abstract

The large crowds' rush in the shopping malls is increasing day by day. Modern technology has increased the standard of living for humans day by day and large numbers of people are seen at shopping malls. To save the time of customers, it is important to reduce the time of the billing queue. This is done by using an automatic shopping trolley that uses an RFID sensor. Items that are put in a shopping cart read the RFID tag one by one and the bill is generated and displayed on the LCD display of the trolley and on the website as well. After the total bill is generated, the customer of the shopping mall usually pays their bills by using their net-banking or by using UPI. The main aim of this work is to reduce the time for billing.

Introduction

Now a day's shopping is one of the most difficult things to be waiting in a queue for a long time for the billing of the products that are put in the cart. The greater the number of products can add, the more time-consuming it is at the time of billing. The main aim of the smart trolley is to reduce the time management for the billing to avoid huge crowds in the billing area of the shopping mall. So, that the customer does not have to wait at the time of making payment. The customer only needs to pay by their card or through online mode. The other feature of this smart trolley is that the customer can make payment through their net-banking or by using their UPI payments. Finally, the information for the payment will be sent to the display or to the website of the shopping mall to the individual's account.

Section snippets

Literature survey

Low Power Optimization of Full Adder using GNRFET Technology– A Review

Publisher: IEEE

Sanjay Singh ; Pooja Saxena ; Mukesh Kumar Ojha ; Dhiraj Gupta **All Authors** •••

Abstract: This review paper illustrates the advantages of GNRFETs and their use in adder circuits to reduce interconnect and improve delay, power dissipation, and speed. Future nan... **View more**

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Abstract:
This review paper illustrates the advantages of GNRFETs and their use in adder circuits to reduce interconnect and improve delay, power dissipation, and speed. Future nanotechnology will have to deal with CMOS limitations such as DIBL, short channel effect, high leakage current, and temperature-dependent threshold voltage. Graphene nanoribbon FET solves these problems. Because its channel is formed by graphene ribbons, graphene nanoribbon FETs have replaced CMOS. Several studies are currently underway to develop and examine the application of graphene nanoribbon FET in half and full adders. A comparison study for half and full adders using graphene nanoribbon FETs is presented in this article, with parameters like propagation delay, power dissipation, and PDP being studied. In comparison to CMOS logic, graphene nanoribbon FET-based digital circuits are substantially more efficient. We are expecting 99%, 85%, 97% and 87% reduction in power consumption, delay, Power delay product and leakage power respectively. HSPICE software is used to simulate the performance parameters and results.

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Fwd: Proceedings_Technovation2021

1 message

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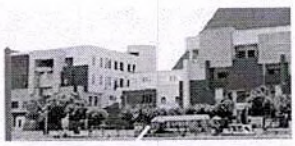

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9. Cinnamon

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Tyagi Shweta, Tyagi Kapil

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Greater Noida Institute of Technology,
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Abstract:

Cinnamon in India, is commonly known as "Dalchini". It is well known spice which is used all around the world in different forms and in different ways. Cinnamon belongs to the family Lauracae. The cinnamon is mainly cultivated to get cinnamon bark, cinnamon leaf and cinnamon oil. Cinnamon is a hardy plant; it can be cultivated in any type of soil. But the climatic conditions affect the quality and nutritional composition of the bark or tree. The cinnamon has sweet and volatile aroma because of the presence of volatile compounds in it. The nutritional content of cinnamon varies, depending on the geographical conditions where it is grown and processed. Fertilizers are applied in two equal doses during the month of April to June and August to October. In case of cinnamon, pruning is not much required, only damaged parts and branches are removed from the plant. The shoot of the cinnamon are harvested in the month of Sep-Nov. Its processing costs account for 60% of its total production cost. It indicates that the processing of cinnamon is most crucial, time taking and laborious job. This processing affects the total quality of the end product. The products we get from cinnamon tree are used in the medical treatment of many ailments like fungal infections, blood sugar, cough, cold, diarrhoea, tooth ache, etc. Due to its medical and health related benefits; it is easily marketed to pharmaceutical companies, ayurvedic stores, local markets, hotels and restaurants.

Keywords: *Cinnamon, nutritional composition, processing, ailments*

9.1 Introductions:

Cinnamon, one of the world's most beloved and popular spices, is used almost all over the world. We obtain this spice from the dried inner bark of a tree known as Cinnamomum zeylanicum. Indonesia is the biggest producer of cinnamon, accounts for nearly 40 percent of the total global production. Next to Indonesia is China, followed by Vietnam and Sri Lanka. The dried inner stem of Cinnamon vernam is the True Cinnamon or Sri Lankan Cinnamon. These evergreen plants are grown as bushes. At the age of two years they are measured about 2 meter in height and at base 8 to 12 cm. At this stage they are ready to

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5. Chicory Roots

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Abstract:

Chicory (chincorium intybus) is a flowering plant usually found near the roadside Chicory roots are elongated rigid, fleshy tapered shape tap roots. Raw chicory root can be eaten as a salad or as boiled it has many medicinal and nutritional properties. It is used to flavor the food and packing food. Chicory root has starch like inulin fibre. Chicory root is used to extract chicory coffee, chicory wine and vinegar also. Chicory coffee is ultimate substitute of caffeine-free coffee. It is the rich source of vitamin C, manganese, inulin, potassium, phosphorus, due to their antioxidant properties, they can help boost immunity. It is used for constipation, regulate blood pressure, loss of appetite stomach upset, gall bladder disorder and weight loss. Chicory root fiber inulin is sweet in taste so can be used as sweetener for diabetes. Although ground and supplemental chicory root is considered as safe but can cause bloating and gastritis. Due to various health and medicinal benefits, it is a subject for research and investigation.

Keywords: *Inulin, extract, roast, soak, submerged.*

5.1 Introduction:

Chicory is a plant that belongs to the daisy family Asteraceae. It is a flowering plant with white or pink or blue color. Chicory has many varieties which are cultivated for chicons (buds), Salad (leaf) and roots (coffee), and many more.

Inulin which is an extract of chicory root has been used in the food industry as a sweetener for dietary fiber. ***(Raninen, 2011)****. Chicory is grown as a forage crop.* ***(Blair, and Robert, 2011)****. Chicory is the common roadside plant in North America, China, Australia, and Native Europe.* ***(Flora of China, 2016).*** *Its seeds, roots, and dried above-ground parts have many medicinal properties.*

Chicory roots can be smaller or large according to cultivation conditions chicory roots may be an elongated slender tapered shape with narrows to a thin point like parsnip. The skin is cream-colored to tan, thin firm, and covered with root hairs.

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4. Seaweeds

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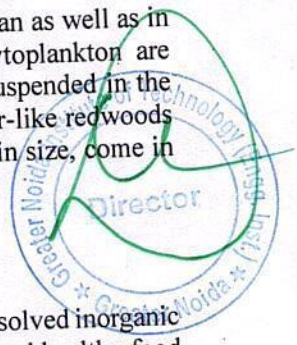
Abstract:

Throughout the world, many natural resources necessitate the development of alternative resources to produce commodities such as food, fuel, cosmetics, and pharmaceuticals. Seaweed aquaculture has the potential to play an important role in the future marine resource. China and Indonesia are the biggest producers of brown and red algae. The various seaweeds are processed by biotic process and abiotic process, the microwave system is reducing extraction time and also consumption of organic solvents. Due to anti-microbial, anti-inflammatory agents, antioxidant characteristics, there are more species of seaweeds that are used in pharmaceuticals. Seaweed contains many vitamins (A, C, and E), minerals, and protective pigments. Seaweed has a decent amount of iodine, a trace mineral vital for human health and the function of the thyroid. It is a huge marine resource for mankind, drugs, cosmetic products, nutraceuticals, and foods.

Key Words: *Marine Resources, Algae, Pharmaceutical, Seaweed Iodine, Antioxidant*

Seaweeds are countless species of marine plants and algae found in the ocean as well as in lakes, rivers, and other water bodies. Some seaweeds such as the phytoplankton are microscopic that provide the base for most marine food chains and live suspended in the water column. Some are enormous that grow in abundant forests and tower-like redwoods in underwater from their roots at the bottom of the sea. Most are medium in size, come in colors of brown, red, green, and black. (NOAA, 2021)



4.1 Production:

Seaweeds (autotrophic organisms) use sunlight to extract from the water dissolved inorganic nutrients and produced biomass. For that reason, besides being nutritious and healthy food and other applications, seaweeds are a very crucial compound for sound ecosystem management. In the twenty-first century, the exploitation of marine resources (for example, fed aquaculture of finfish and shrimp) will need to balance with the establishment of seaweeds production for the sustainable growth of aquaculture. Seaweed already represents

HEALTHY DIET FOR HEALTHY LIFE

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to me

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